

**Notice of Allowability**

Application No.

09/650,287

Applicant(s)

LEE ET AL.

Examiner

Prieto Beatriz

Art Unit

2142

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9/15/04.
2. ☒ The allowed claim(s) is/are 2-6, 8, 9, 11-13, 15, 16, 18 and 20.
3. ☒ The drawings filed on 24 September 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

*Beatriz Prieto*  
Patent Examiner  
12/07/04

*Examiner's Amendment*

1. An Examiner's Amendment to the record appears below. Should the changes or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 C.F.R. § 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the Issue Fee.

2. Pursuant to M.P.E.P. §606.01, this title has respectfully been changed to read as follows:

**-- METHOD AND APPARATUS FOR COMPUTING THE SHORTEST PATH  
BETWEEN NODES BASED ON THE BANDWIDTH UTILIZATION LINK LEVEL --**

*Reason for allowance*

3. The following is the Examiner's statement of Reason for Allowance. This statement is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed, nor it specifically or impliedly state that all the reasons for allowance are set forth. The primary, or important reason for allowance of the claims is the inclusion of the limitation(s) in all the claims, which is not found in the prior art references.

In this case, the claimed term "bandwidth utilization level", according to the invention refers to the "load" level of a link connecting at least two nodes (specs p. 4, lines 26-35, p. 8, lines 18-27, p. 9, lines 9-27, and as argued by applicant on remarks mailed 4/28/04 on p. 4-7). The term "bandwidth level" in the applied prior art has a meaning different from the "bandwidth utilization level" of the claims. The Daley reference defines bandwidth load as the load available in transmission links (column 3, lines 43-63). The shortest path route for a network, according to the Berlin reference, is computed and organized according to network constraint i.e. bandwidth brackets, e.g. from lowest fit (i.e. the lowest bandwidth that will accommodate the request), to the highest bandwidth bracket available (column 3, line 63-column 4, line 11).

Hence, although the prior art teaches the iterative computation of determining the shortest path between at least two nodes in a network (e.g. well known Bell-Ford or shortest path tree (SPT) algorithms) and further teaches the iterative computation of determining the shortest path based on the available bandwidth (e.g. the Daley reference). The prior art of record does not teach determining the “ideal” shortest path based on the “bandwidth utilization level”, as defined by the invention’s disclosure (MPEP §2111), and set forth on claims 2, 8, 11, 15, 18 and 20. Prior art further fails to teach alone or in combination computing the shortest path described above including adjusting said bandwidth utilization threshold level within each iteration, as set forth on claims 2, 8, 11, 15, 18 and 20.

4. Claims 2-6, 8-9, 11-13, 15-16, 18 and 20 are allowed because of the combinations of other limitations and the limitation listed above.

5. Other references considered pertinent to applicant’s disclosure were identified, as a result of further search(es) and are hereby made of record via an Appendix.

6. Double patent analysis has been performed with respect to issued patents having common relationship of inventorship and/or ownership with respect to the above-allowed claims, none are found to warrant a double patenting rejection.

7. Any comments Applicants considers necessary must be submitted no later than the payment of the Issue Fee and to avoid processing delays, should preferable accompany the Issue Fees. Such submission should be clearly labeled “ Comments on Statement of Reasons for Allowance”. In event of any post-allowance papers (e.g. IDS, 312 amendment, petition, etc.), Applicant is exhorted to mail papers to the Production Control branch in Publications or faxed to post-allowance papers correspondence branch at (703) 308-5864 to expedite issuing process or call PUB’s Customer Service if any questions at (703) 305-8497.

Art Unit: 2142

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. Prieto whose telephone number is (571) 272-3902. The Examiner can normally be reached on Monday-Friday from 6:30 to 4:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's Supervisor, Jack B. Harvey can be reached on (571) 272-3896. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800/4700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system, status information for published application may be obtained from either Private or Public PAIR, for unpublished application Private PAIR only (see <http://pair-direct.uspto.gov> or the Electronic Business Center at 866-217-9197 (toll-free)).

Any response to this action should be mailed to:


**Box Issue Fee**  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

or faxed to:

(703) 746-4000, (Issue Fee and any Publication fee/payments)

Or:

(703) 305-8283 (for checking on receipt of payment w/Publication)

  
B. Prieto  
Patent Examiner  
December 8, 2004

**Pertinent Prior Art (Appendix):**

The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pertinence is presented in accordance with MPEP§ 707.05.

US 5,410,586 (April 1995)

Davies teaches a routing algorithm for determining the *best path* over which to send the traffic to arrive at the destination node Y from the origination node X, including a simple routine which determines whether there is a link path between node X and node Y. *Bandwidth utilization* are readily determined, along with the number of trunks and the amount of traffic which is in the network. The identity of the link between the two nodes is determined, and the amount of bandwidth utilized for all calls on the link can be readily determined from field 6 the link record, Ld link bandwidth in use. *The bandwidth utilization is calculated* for this network as the bandwidth in use to total bandwidth available. Reference again to the link table will illustrate the total bandwidth available in Ld for an analysis of the bandwidth utilization.

US 5,872,773 (Feb. 1999)

Katela et. al. Discloses as prior art algorithms to *compute K shortest paths between a given source and destination* such that they are maximally disjoint.

US 5,884,037 (Mar. 1999)

Aras et. al. teaches computing the *actual bandwidth utilization* at any given time (labeled as "Bandwidth Samples") including monitoring the actual bandwidth utilization in the telecommunications network 104 from samples received from the connection agent 105 via path 114 and predicting an expected bandwidth and *determining the best route for a connection by examining the predicted bandwidth* on each link and applying a routing algorithm such as a minimum spanning tree to find the most efficient route.